



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kie Y. Ahn et al.

Title: BIPOLAR TRANSISTORS WITH LOW-RESISTANCE EMITTER CONTACTS

Docket No.: 303.466US1

Serial No.: 09/069,668

Filed: April 29, 1998

Due Date: August 9, 2001

Examiner: W. David Coleman

Group Art Unit: 2823

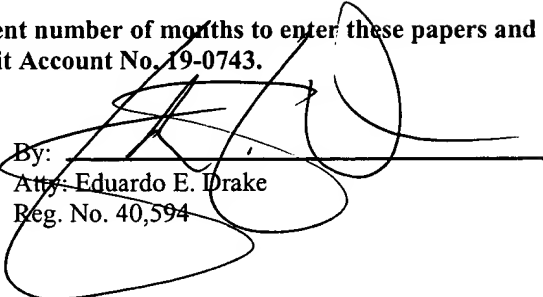
Commissioner for Patents
Washington, D.C. 20231

We are transmitting herewith the following attached items (as indicated with an "X"):

- X A return postcard.
- X An Amendment and Response (3 Pages).

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Tina Pugh
Name

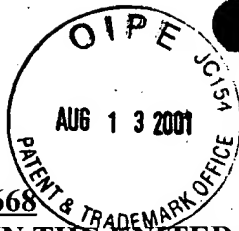
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S/N 09/069,668

PATENT

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Serial No.: 09/069,668 Group Art Unit: 2823
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Title: BIPOLAR TRANSISTORS WITH LOW-RESISTANCE EMITTER CONTACTS

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

Commissioner for Patents
Washington, D.C. 20231

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Applicant has reviewed the Office Action mailed on May 9, 2001.

REMARKS

Claims 1-30 and 32-39 are pending in this application. The Office Action indicates allowance of claims 12-27 and 32.

The current Office Action as well as the Advisory Action of November 11, 2000 indicate that claims 29 and 30 have been withdrawn from further consideration. However, applicant believes that these claims also have an allowed status as stated at paragraph 5 of the June 21, 2000 Office Action. In view of the conflicting indications, applicant requests clarification of the status of these claims.

Applicant reserves the right to address any tacit or explicit characterization of the references cited in the Office Action, to the extent that the following remarks do not.

Response to §103 Rejection

The Examiner rejected claims 1-3, 7-11, 28, and 35-39 under 35 USC § 103(a) as unpatentable over Tsai (U.S. Patent 5,235,204) in view of Wolf ("Silicon Processing for the VLSI ERA", Vol. 2, (Process Integration), Lattice Press, 1990 pp. 116-117 and 126-127).

In response, applicant submits that the rejection fails to make a prima facie case of obviousness and should be withdrawn. Specifically, the rejection concedes that in Tsai, "the metal emitter contact is not cross-diffused for a portion of the polysilicon structure," but proposes that "[i]n view of Wolf, it would have been obvious to cross-[diffuse] a portion of the polysilicon into the metal emitter contact of Tsai because this process alleviates the problem of

junction spiking (pp. 116).”

However, page 116 of Wolf does not report cross-diffusion as alleviating the problem of junction spiking. Instead, this page reports use of an aluminum-silicon film to alleviate the spiking and production of the aluminum-silicon film by sputtering from an aluminum-silicon target. More precisely, page 116, lines 6-12 states

To alleviate the problem of junction spiking at contacts without abandoning the advantages of simple Al-to-Si contact structures, Si can be added to the Al film as it is deposited. This is typically accomplished by sputter depositing the film from a single target containing both Al and Si, although coevaporation of Si and Al has also been used. If enough Si is added to the Al ..., diffusion of Si into the Al will no longer occur, and junction spiking can be prevented.”

Thus, this portion of Wolf does not teach or suggest cross-diffusing silicon into aluminum to prevent junction spiking. On the contrary, it teaches prevention of silicon diffusion into the aluminum, thereby teaching away from an act of cross-diffusing metal and polysilicon as the rejected claims require. Furthermore, at page 126, line 1, Wolf states “[i]nterdiffusion is the dominant process that destroys these contact structures,” again appearing to teach away from an act of cross-diffusing metal and polysilicon.

Accordingly, the 103 rejections based on Tsai and Wolf should be withdrawn, not only because of an insufficient motivation to combine, but also because Wolf teaches away from the claimed invention.

The Examiner rejected dependent claim 6 as unpatentable over Tsai in view of Wolf, and further in view of Aboelfotoh (U.S. Patent 5,801,444). In response, applicant submits that this proposed three-part combination of Tsai, Wolf, and Aboelfotoh inherits the proposed insufficient motivation for combining Tsai and Wolf. Accordingly, the rejection of claim 6 fails to establish a prima facie case for obviousness and should be withdrawn.

Conclusion

In view of the insufficient motivation to combine Tsai and Wolf, applicant respectfully request reconsideration and withdrawal of the 103 rejections. Additionally, applicant invites the Examiner to call its patent counsel Eduardo Drake to resolve any issues which may delay allowance.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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By their Representatives,

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Date

8 August 2001

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Signature

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